U.S. Department of Transportation
National Highway Traffic Safety Administration

TRAFFIC SAFETY FACTS
Research Note

NHTSA

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Overview of the 2019 Crash Investigation Sampling System

Summary

In 2019 there were an estimated 2,736,257 police-reported motor vehicle crashes where at least one passenger vehicle (i.e., passenger car or light truck[1]) was towed from the crash scene in the United States. These crashes resulted in an estimated 1,356,689 injured occupants of towed in-transport passenger vehicles. Among these crashes, 2.8 percent (76,959) were crashes with injury levels of serious or above, 31.5 percent (861,214) were crashes with moderate or minor injury levels, and 48.5 percent (1,326,984) were crashes with no injury.

Introduction

The National Highway Traffic Safety Administration is releasing the third year of data from the newly modernized Crash Investigation Sampling System (CISS) – a replacement of the National Automotive Sampling System Crashworthiness Data System (NASS CDS). NHTSA designed CISS to select a more efficient and flexible sample using updated traffic and demographic information and optimizing the sample to better meet data users' needs. For more information see the Technical Report, *Crash Investigation Sampling System: Sample Design and Weighting* (Zhang et al., 2019a). In 2019 motor vehicle traffic crashes that involved at least one passenger vehicle towed from the scene of the crash were sampled, investigated, and coded at 32 selected sites across the Nation. Weighting procedures were applied to generate nationally representative estimates of such crashes. This Research Note presents an overall summary of key estimates of crashes in 2019.[2] For a more detailed explanation of the sample design, estimation protocols, and guidance on how to analyze the new data, please refer to the *Crash Investigation Sampling Design: Design Overview, Analytic Guidance and FAQs* (Zhang et al., 2019b). In addition to sample design and weighting enhancements, several improvements were made to information technology infrastructure and operational protocols of CISS to gather more relevant, accurate, and nationally representative data.

Results

Crashes: As shown in Table 1 and Figure 1, there were an estimated 2,736,257 police-reported crashes where at least one passenger vehicle was towed from the scene in 2019. The Crash Abbreviated Injury Scale (CAIS) is the basis of Table 1 and Figure 1. CAIS is the most severe injury level among the occupants of towed in-transport CISS-applicable vehicles involved in a crash. There were an estimated 76,959 [59,422+9,845+5,566+2,126] crashes with injury levels of serious or above. An estimated 861,214 [720,029+141,185] crashes resulted in minor or moderate injury levels, and an estimated 1.327 million crashes were no-injury crashes.

Table 1
CISS-Applicable Police-Reported Motor Vehicle Crashes In 2019, by Crash AIS

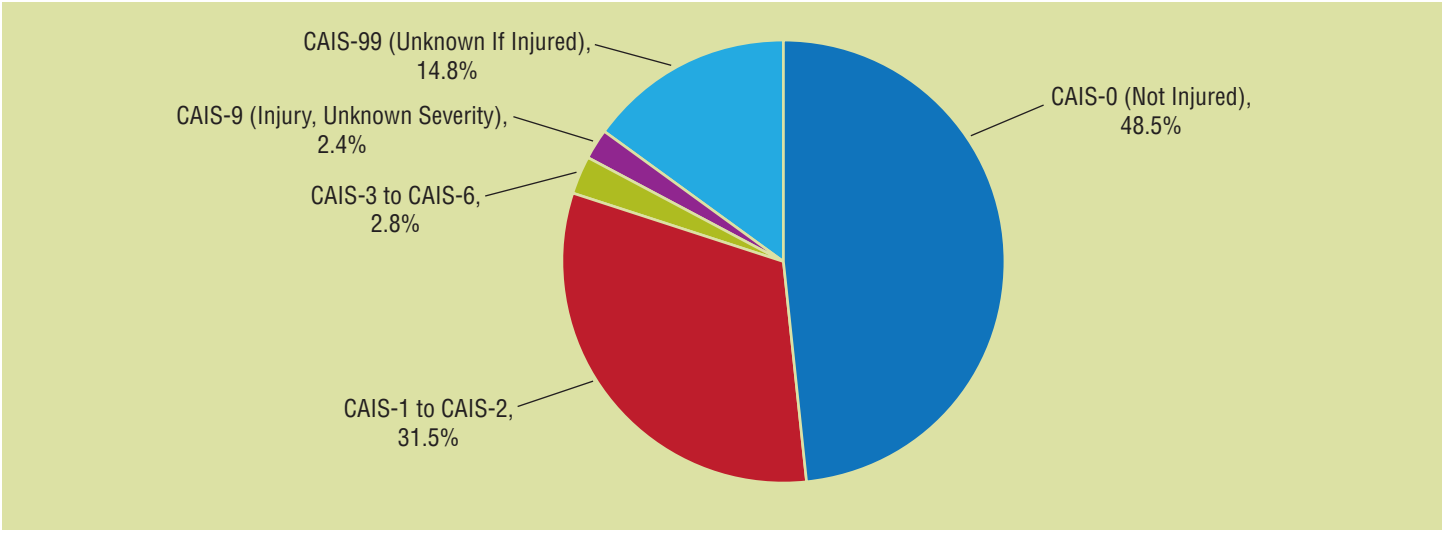
Crash AIS (CAIS)	Estimates [Standard Error]	Percent of Total Crashes
0-Not Injured	1,326,984 [97,591]	48.5%
1-Minor	720,029 [86,724]	26.3%
2-Moderate	141,185 [15,816]	5.2%
Subtotal (CAIS-1 to CAIS-2)	**861,214**	**31.5%**
3-Serious	59,422 [11,994]	2.2%
4-Severe	9,845 [2,270]	0.4%
5-Critical	5,566 [1,283]	0.2%
6-Maximum (Untreatable)	2,126 [785]	0.1%
Subtotal (CAIS-3 to CAIS-6)	**76,959**	**2.8%**
9-Injury, Unknown Severity	64,995 [18,969]	2.4%
Subtotal (CAIS-1 to CAIS-9)	**1,003,168**	**36.7%**
99-Unknown If Injured	406,104 [42,610]	14.8%
Total	**2,736,257 [123,148]**	**100.0%**

Source: 2019 CISS. Some components may not add to subtotals or totals due to independent rounding.

[1] Lights trucks include pickups, vans, and SUVs.

[2] This research note does not include comparisons to 2018 CISS. For more information on CISS 2018, refer to National Center for Statistics and Analysis. (2020, June). Overview of the 2018 Crash Investigation Sampling System. (Traffic Safety Facts Research Note. Report No. DOT HS 812 971). National Highway Traffic Safety Administration, available at https://crashstats.nhtsa.dot.gov/Api/Public/Publication/812971

Figure 1
CISS Applicable Police-Reported Motor Vehicle Crashes in 2019, by Crash AIS



Vehicles Involved: As shown in Table 2, there were an estimated 5.079 million vehicles involved in police-reported motor vehicle crashes where at least one passenger vehicle was towed in 2019. Of the 5.079 million vehicles, 2.774 million vehicles were passenger cars (54.6%) and 2.120 million vehicles were light trucks (41.8%).

Table 2
Passenger Vehicles Involved in CISS-Applicable Crashes In 2019, by Vehicle Type

Vehicle Type	Estimates [Standard Error]	Percent of Total Crashes
Passenger Cars	2,774,348 [239,286]	54.6%
SUVs, Vans, and Light Trucks	2,120,413 [108,803]	41.8%
Subtotal	**4,894,761**	**96.4%**
Total*	**5,078,796 [295,572]**	**100.0%**

Source: 2019 CISS. Some components may not add to subtotals or totals due to independent rounding.

*Total includes non-passenger vehicles (i.e., large trucks, motorcycles buses, other, and unknown vehicle types). The results are not displayed because minimal information is collected in CISS on non-passenger vehicles.

Occupants Involved: Table 3 shows the maximum AIS (MAIS) of occupants of towed in-transport passenger vehicles involved in crashes where at least one passenger vehicle was towed. In 2019 an estimated 5,117,078 occupants were involved in CISS crashes. Of the 5,117,078 occupants, 2,269 (less than 0.1%) had a maximum (untreatable) injury, 5,856 (0.1%) had a critical injury, 10,276 (0.2%) had a severe injury, 68,974 (1.3%) had a serious injury, 154,662 (3.0%) had a moderate injury, 987,703 (19.3%) had a minor injury, and 3,162,305 (61.8%) had no injury.

Table 3
Occupants of Towed In-Transport Passenger Vehicles Involved in CISS Crashes in 2019, by Maximum AIS

Maximum AIS (MAIS)	Estimates [Standard Error]	Percent of Total Crashes
0-Not Injured	3,162,305 [279,007]	61.8%
1-Minor	987,703 [113,285]	19.3%
2-Moderate	154,662 [15,011]	3.0%
Subtotal (MAIS-1 to MAIS-2)	**1,142,365**	**22.3%**
3-Serious	68,974 [13,999]	1.3%
4-Severe	10,276 [2,214]	0.2%
5-Critical	5,856 [1,381]	0.1%
6-Maximum (Untreatable)	2,269 [820]	<0.1%
Subtotal (MAIS-3 to MAIS-6)	**87,375**	**1.7%**
9-Injury, Unknown Severity	126,949 [36,662]	2.5%
Subtotal (MAIS-1 to MAIS-9)	**1,356,689**	**26.5%**
99-Unknown If Injured	598,083 [72,453]	11.7%
Total	**5,117,078 [389,206]**	**100.0%**

Source: 2019 CISS. Some components may not add to subtotals or totals due to independent rounding.

Comparisons of CISS With NASS-CDS, FARS, and CRSS

Comparisons of CISS estimates with NASS-CDS estimates should be performed with caution because they are two completely independent sample surveys designed more than 30 years apart. CISS and NASS-CDS have different target populations. CISS targets crashes where at least one passenger vehicle is towed from the scene (for any reason), whereas NASS-CDS targeted crashes where at least one passenger vehicle is towed *due to damage.* Also, CISS case selection is based on newer vehicles with higher severity injuries, whereas, NASS-CDS case selection was first based on injury severity, then the model year of the vehicle. Since NASS-CDS is a subpopulation of CISS, it is possible to combine both data systems. For more information on combining NASS-CDS and CISS, refer to the *Crash Investigation Sampling Design: Design Overview, Analytic Guidance and FAQs* (Zhang et al., 2019b).

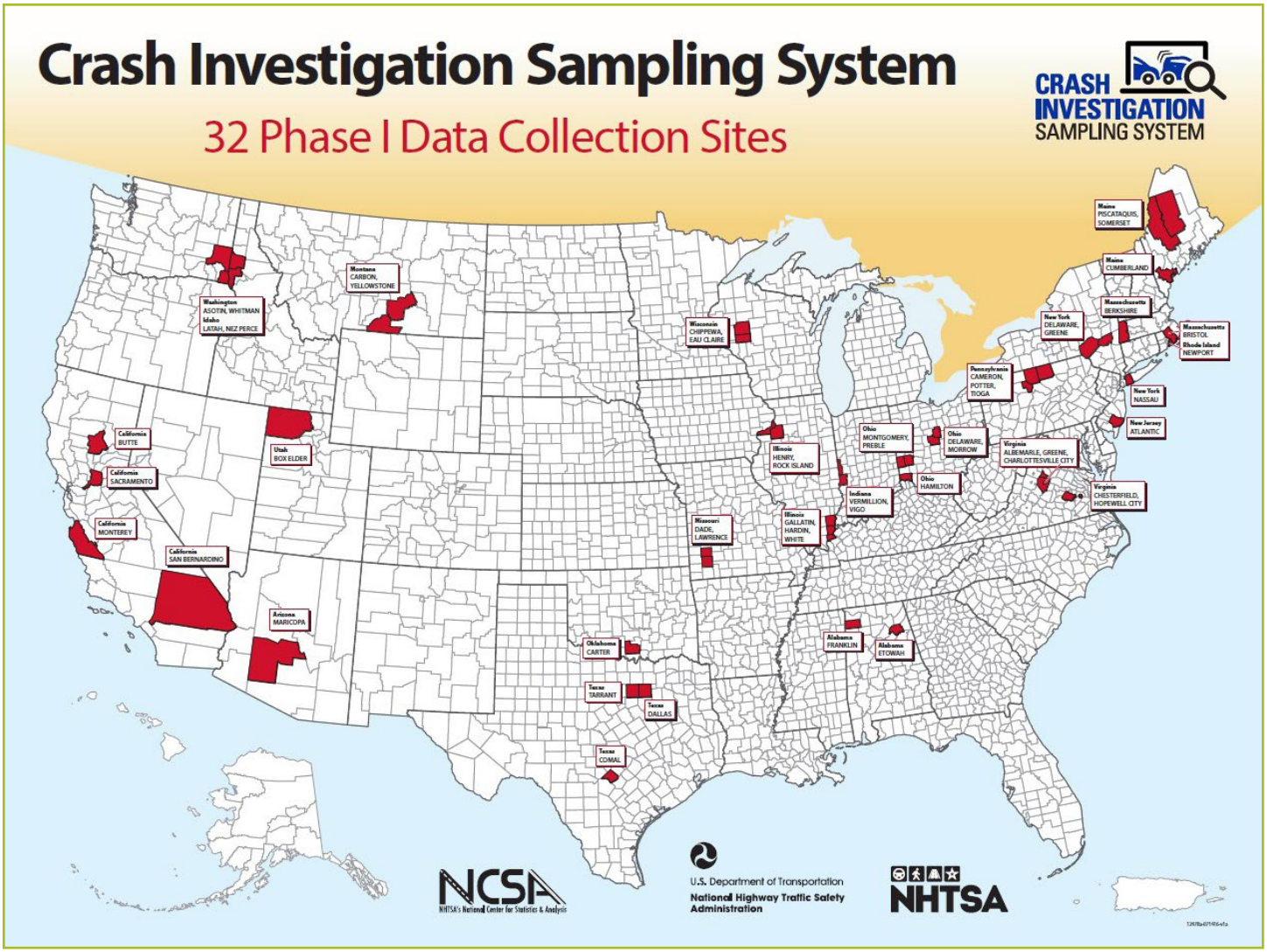
Additionally, CISS target population is a sub-population of the Crash Report Sampling System (CRSS) target population. CRSS targets police-reported crashes on a trafficway in the United States. Estimates of total crashes from CISS are similar to the estimates of total crashes from the corresponding CRSS sub-population.

The Fatality Analysis Reporting System (FARS) is a national census of fatal crashes. CISS in-scope fatal crashes are also a sub-population of FARS. However, CISS data is normally collected within one or two weeks after the crash, while FARS has much longer time to identify and collect fatal crash data. Due to the nature of serious crashes and injury outcomes, CISS fatal crash counts and FARS may not be comparable.

The 2019 CISS Sample

The map below shows the 32 data collection sites selected for CISS.

Figure 2
CISS Data Collection Sites



In 2019 CISS selected 3,090 police-reported crashes from 228 police jurisdictions in 32 sites across the country. Each police-reported crash, where at least one passenger vehicle was towed from the scene, is categorized into ten domains. Table 4 shows the target sample allocation for each analysis domain compared to the actual sampled cases for 2019 CISS. The distribution of the 2019 CISS sampled cases is consistent with target sample allocation distribution. Among the 3,090 crashes, 2,781 crashes[3] were eligible to be investigated and included in the final analytic files for estimation.

Table 4
CISS Sample Allocation versus 2019 CISS Sampled Cases

CISS Analysis Domains	Description	Target Percent of Sample Allocation	2019 Percent of Sampled Cases
1	At least one occupant of towed passenger vehicle is killed	5%	5.0%
2	Crashes not in Stratum 1 involving: • A recent model year passenger vehicle in which at least one occupant is incapacitated	10%	11.2%
3	Crashes not in Stratum 1 or 2 involving: • A recent model year passenger vehicle in which at least one occupant is non-incapacitated, possibly injured, or injured but severity is unknown.	20%	19.7%
4	Crashes not in Stratum 1-3 involving: • A recent model year passenger vehicle in which all occupants are not injured	15%	14.3%
5	Crashes not in Stratum 1-4 involving: • A mid-model year passenger vehicle in which at least one occupant is incapacitated	6%	5.9%
6	Crashes not in Stratum 1-5 involving: • A mid-model year passenger vehicle in which at least one occupant is non-incapacitated, possibly injured or injured but severity is unknown	12%	12.4%
7	Crashes not in Stratum 1-6 involving: • A mid-model year passenger vehicle in which all occupants are not injured	10%	10.1%
8	Crashes not in Stratum 1-7 involving: • An older model year passenger vehicle in which at least one occupant is incapacitated	6%	5.1%
9	Crashes not in Stratum 1-8 involving: • An older model year passenger vehicle in which at least one occupant is non-incapacitated, possibly injured or injured but severity is unknown.	10%	10.6%
10	Crashes not in Stratum 1-9 involving: • An older model year passenger vehicle in which all occupants are not injured	6%	5.7%
Total		**100%**	**100%**

Source: 2019 CISS. Components may not add to 100 percent due to independent rounding.
Recent model year (or late model year): vehicles that are ≤ 4 years old (i.e., any model year of 2015-2020)
Mid-model year: vehicles 5-9 years old (i.e., any model year of 2010-2014)
Older model year: vehicles that are 10 years old or older (i.e., any model year up to 2009)

[3] Out-of-scope cases and replaced sample cases are not investigated or included in the final analytic files.

Downloading and Analyzing 2018 and 2019 CISS Data

The 2018 CISS can be downloaded at www.nhtsa.gov/content/nhtsa-ftp/280071

The 2019 CISS can be downloaded at www.nhtsa.gov/content/nhtsa-ftp/280471

The analytic user's manual can be found at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813039

The NHTSA Field Crash Investigation Coding and Editing Manual can be found at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813042

Crash Investigation Sampling System: Design Overview, Analytic Guidance, and FAQs can be found at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812801

Crash Investigation Sampling System: Sample Design and Weighting can be found at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812804

A databook providing weighted and unweighted univariate distributions of the variables in CISS can be found at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813040

References

Zhang, F., Noh, E. Y., Subramanian, R., & Chen, C.-L. (2019a, September). *Crash Investigation Sampling System: Sample design and weighting* (Report No. DOT HS 812 804). National Highway Traffic Safety Administration. Available at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812804

Zhang, F., Subramanian, R., Chen, C.-L., & Young Noh, E. Y. (2019b, September). *Crash Investigation Sampling System: Design overview, analytic guidance, and FAQs* (Report No. DOT HS 812 801). National Highway Traffic Safety Administration. Available at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812801

For questions regarding the information presented in this report, please contact NCSARequests@dot.gov.

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This research note and other general information on highway traffic safety may be accessed at: https://crashstats.nhtsa.dot.gov/